FINA OIL & CHEMICAL
COSDEN CHEMICAL DIV.

CALUMET CITY, ILLINOIS

ENSR

REPORT ON SOIL & GROUNDWATER SAMPLING

FORMER ROHM & HAAS SITE

ENSR Constructors

May 1990

Document Number 9500-058-330

ENSR

ENSR Constructors
740 Pasquinelli Drive
Suite 124
Westmont, Illinois 60559
708-887-1700

May 8, 1990

Mr. Gerry Hardin
Fina Oil & Chemical
Cosden Chemical Division
P. O. Box 178
Calumet City, IL 60409

Dear Gerry:

Enclosed are the results from the soil, and groundwater analytical work performed at the site of the former Rohm & Haas plant located at your Calumet City facility. Also included is a groundwater elevation map which was developed as part of the project.

As can be seen from both the soil and water analysis, formaldehyde is the only chemical which occurs with any consistency. This may be of concern since formaldehyde is listed as a carcinogen. You may wish to consider having a risk analysis performed (as was done with other areas of the facility) to determine the actual risk posed by formaldehyde in these concentrations.

If you have any further questions on this, or any other work to be performed at the site, please do not hesitate to call.

Sincerely,

ENSR CONSTRUCTORS

John J. Schiffgens, II
Project Manager

JJS/bjp

Enclosure

FINA OIL & CHEMICAL
COSDEN CHEMICAL DIV.

CALUMET CITY, ILLINOIS

REPORT ON SOIL & GROUNDWATER SAMPLING

FORMER ROHM & HAAS SITE

ENSR Constructors

May 1990

Document Number 9500-058-330

ENSR

Formerly ERT

ENSR Consulting
and Engineering
740 Pasquinelli Drive
Westmont, Illinois 60559
(708) 887-1700
FAX (708) 850-5307

May 7, 1990

ENSR Doc. No: 9500-058-330

Mr. Gerry Hardin
Fina Oil & Chemical
Cosden Chemical Division
P.O. Box 178
Calumet City, Illinois 60409

SUBJECT: Report on the Soil and Groundwater Sampling Investigation at the Fina Oil & Chemical, Cosden Chemical Division in Calumet City, Illinois

Dear Mr. Hardin:

ENSR Consulting and Engineering (ENSR) is pleased to present the results of the soil and groundwater sampling investigation conducted at the subject site. On March 26, 1990, ENSR conducted a subsurface investigation at the Fina Oil & Chemical, Cosden Chemical Divison facility in Calumet City, Illinois. The study area was located along the perimeter of the polyethylene emulsion plant. The field work involved in the investigation included collecting soil samples for laboratory analysis, installation of monitoring wells, the collection and analysis of groundwater samples, and obtaining groundwater elevations using differential leveling techniques. These tasks are described in greater detail below.

FIELD INVESTIGATION

ENSR subcontracted with Fox Drilling, Inc. (Fox), of Itasca, Illinois, to drill three soil borings ranging in depth from 8 to 10 feet below ground surface. The borings, designated MW-1A, MW-2A, and MW-3A, were drilled on March 26, 1990.

After the equipment and tools used for drilling the borings had been thoroughly steam cleaned, Fox began drilling at the location designated MW-1A. All borings were advanced using hollow-stem auger and were terminated when silty clay was encountered, typically 8 to 10 feet below the ground surface (see Attachment 1 for soil boring logs).

Soil samples were collected above and at the water table for laboratory analysis. In the 3 borings that were subsequently converted to monitoring wells, the depth to groundwater ranged from 2 feet to 5.5 feet below the ground surface. The soil samples were collected using a stainless steel split-spoon sampler (Per ASTM D1586) and field-screened using a

photo-ionization detector (PID). The PID measures volatile compounds released from the soils. The split-spoon sampler was decontaminated using a high-pressure steam cleaner before the collection of each sample to ensure that cross contamination between samples and borings did not occur.

Each soil sample collected was analyzed for benzene, toluene, ethylbenzene, xylene (BTEX) and styrene using EPA Method SW-846:8020[1] and for formaldehyde using NIOSH Method 3500[2].

To evaluate that proper decontamination procedures had been followed, one field blank sample (equipment blank) was collected for analysis for formaldehyde using NIOSH Method 3500[2]. The field blank is a quality assurance/quality control (QA/QC) sample used to assess whether sampling equipment has been thoroughly decontaminated and whether cross contamination between samples and borings has occurred. The field blank was prepared by pouring distilled water through decontaminated sampling equipment. One duplicate soil sample (MW-3B) was also collected from boring MW-3A to provide a quality check of laboratory analysis.

All samples were collected using ENSR's Standard Operating Procedures (SOPs) and sent to ENSR's Houston, Texas, laboratory under chain-of-custody procedures. The soil sampling results are summarized in Table 1, Attachment 2. The analytical laboratory report for the soil samples and for the field blank is presented in Attachment 3.

MONITORING WELL INSTALLATION

After the soil borings were drilled to a suitable depth, the boreholes were converted into monitoring wells. All three monitoring wells consisted of a 5-foot-long, 2-inch-diameter, number 10-slot, flush joint threaded, stainless steel screen. The screen was attached to a 2-inch-diameter, flush joint threaded, stainless steel pipe extending approximately 2 feet above ground level.

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1 EPA Methods for Evaluating Solid Wastes: Physical/Chemical Methods, SW-846, 3rd edition, 1986.

2 NIOSH Manual of Analytical Methods Formaldehyde, Method 3500, 3rd edition, vol. one, 1984.

The annular space between the screen and the borehole wall was backfilled with a sandpack to approximately 1 foot above the top of the screen. High density bentonite pellets formed an approximately 1-foot-thick bentonite seal above the sandpack. Grout was placed above the bentonite seal and a protective cover was placed over the riser to guard against damage and vandalism. The well completion logs are presented in Attachment 1.

GROUNDWATER SAMPLING

In order to obtain representative groundwater samples for laboratory analysis, the three monitoring wells (MW-1A, MW-2A, and MW-3A) were developed and purged. Development of a well involves removing groundwater from the well, typically three volumes per well (for this investigation, one volume is approximately 1.5 gallons) using a stainless steel bailer. Development allows for silty material disturbed during the drilling procedure to be removed from the well and for the groundwater to flow through the screen more easily.

After development, groundwater was purged from each well, so that the samples obtained represented the saturated zone. Before the development, purging, and sampling of each well, the stainless steel bailer was decontaminated using an Alconox™ soap and potable water wash, a potable water rinse, and a distilled water rinse.

Groundwater samples from monitoring wells MW-1A, MW-2A, and MW-3A were collected and analyzed for BTEX and styrene by EPA Method SW-846:8020 and for formaldehyde using NIOSH Method 3500. A field blank (equipment blank) was collected to evaluate that proper decontamination procedures had been followed. A duplicate groundwater sample (MW-3B) was also collected from MW-3A to provide a quality check of laboratory analysis. The groundwater sampling results are summarized in Table 2, Attachment 2. The analytical laboratory results for the groundwater samples are presented in Attachment 4.

GROUNDWATER LEVEL ELEVATIONS

Differential leveling techniques were used to establish elevations at the monitoring well locations relative to an on-site datum. The bolt on top of the fire hydrant located to the east of the maintenance shop was assumed to have a reference elevation of 100.00 feet. The computed ground surface and top-of-casing elevations relative to the assumed fire hydrant bolt elevation are presented in Table 3, Attachment 2.

Relative groundwater elevations were computed by subtracting the measured depth to groundwater (from top-of-casing) from the relative top-of-casing elevations. Figure 1 shows relative water level elevations measured on May 3, 1990. The relative water level elevations show the direction of groundwater flow to be towards the Little Calumet River.

If you have any questions regarding the field investigation activities or laboratory results, please do not hesitate to call.

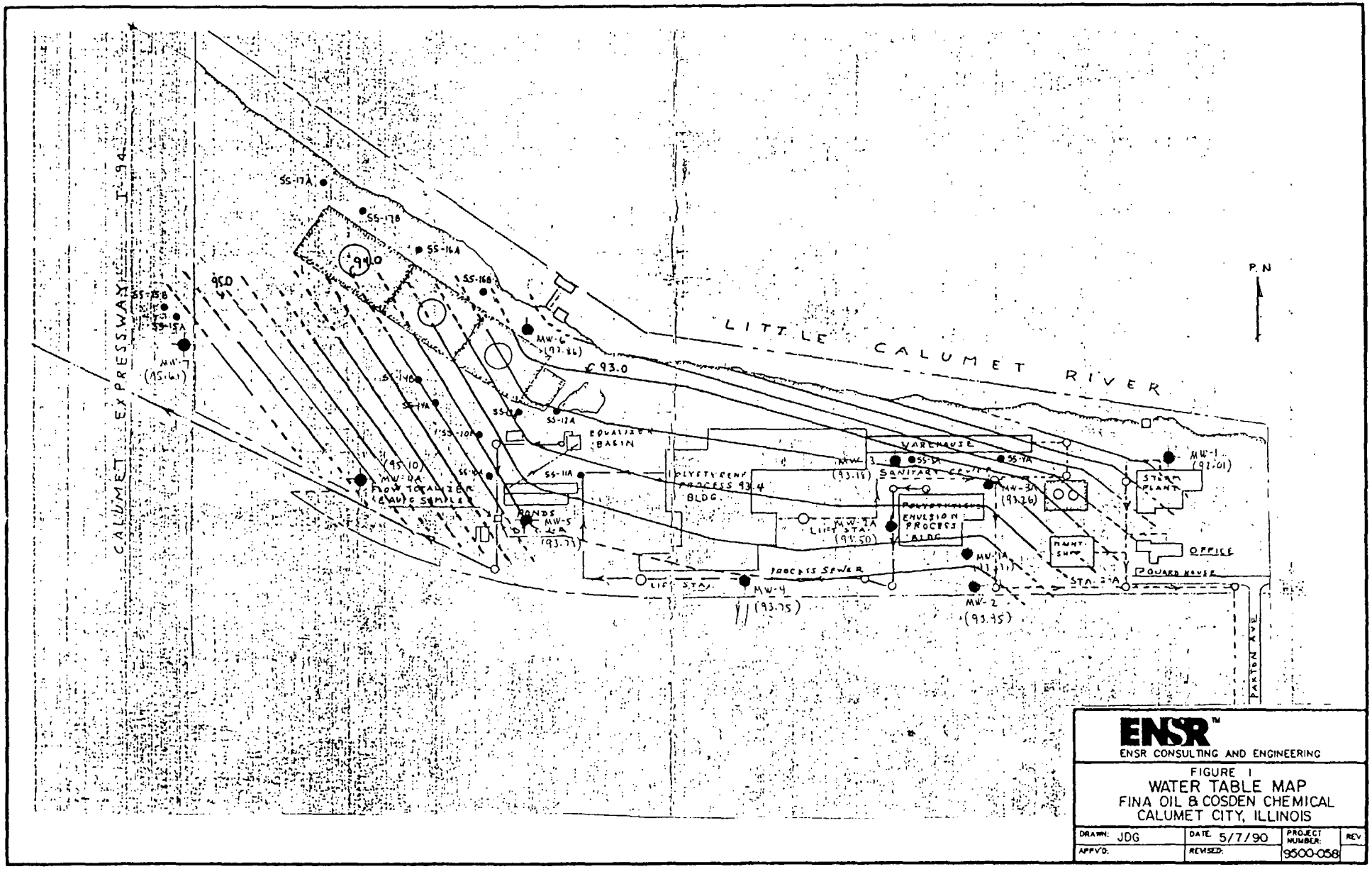
Sincerely,

Gregory J. Smith
Department Manager
Senior Hydrogeologist

GJS/js

Enclosure

Ref. No. 90-04-G333



ENSR™
ENSR CONSULTING AND ENGINEERING

FIGURE 1
WATER TABLE MAP
FINA OIL & COSDEN CHEMICAL
CALUMET CITY, ILLINOIS

DRAWN: JDG	DATE: 5/7/90	PROJECT NUMBER: 9500-058	REV
APPV'D:	REVISED:		

ATTACHMENT 1

SOIL BORING AND WELL INSTALLATION LOGS

LOG OF BORING

MW-1A
Page 1 of 1

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA OIL AND CHEMICAL
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-330

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC

GROUND ELEV. : 96.29
T.O.C. ELEV. : 98.42

DATE STARTED : 3-26-90
DATE COMPLETED : 3-26-90
TOTAL DEPTH : 9.5 ft
METHOD : HSA

WELL I.D. : 2.0
CASING LENGTH : 5.5
SCREEN LENGTH : 5.0
SLOT SIZE : 0.01
TYPE : 304 Stainless Steel
TYPE : 304 Stainless Ste

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION
							Gravel (GP) - crushed limestone
							CLAY (CL) - silty, soft, black to gray
							CLAY (CL) - silty, trace sand, soft, grey
			S-1	s.s.	11	0	SAND (SP) - fine to medium grained, saturated, brown
5							
							CLAY (CL) - trace sand, fine to medium grained, gray
							END OF BORING @ 9.5 FEET
10							

GRAPHIC LOG | WELL COMPLETION | WATER 3-27-90 ▽ | DEPTH (feet)

LOG OF BORING

MW-2A
Page 1 of 1

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA OIL AND CHEMICAL
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-330

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. : 96.50
T.O.C. ELEV. : 98.78

DATE STARTED : 3-26-90
DATE COMPLETED : 3-26-90
TOTAL DEPTH : 10.0 ft
METHOD : HSA

WELL I.D. : 2.0
CASING LENGTH : 5.5
SCREEN LENGTH : 5.0
SLOT SIZE : 0.01
TYPE : 304 Stainless Steel
TYPE : 304 Stainless Stee

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION
							Gravel (GW) - crushed limestone, gray
							Silty CLAY (CL-ML) - soft, black to gray
			S-1	s.s.	4	3	
			S-2	s.s.	5	0	
							SAND (SP) - fine to medium grained, saturated, brown
			S-3	s.s.	7	0	
			S-4	s.s.	7	0	
5							
							CLAY (CL) - silty, some sand, gray
10							END OF BORING @ 10.0

GRAPHIC LOG | WELL COMPLETION | WATER | DEPTH (feet)

WATER: 3-27-90

LOG OF BORING

MW-3A
Page 1 of 1

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA OIL AND CHEMICAL
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-330

LOGGED BY : T. DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. : 96.26
T.O.C. ELEV. : 97.98

DATE STARTED : 3-26-90
DATE COMPLETED : 3-26-90
TOTAL DEPTH : 10.0 ft
METHOD : HSA

WELL I.D. : 2.0
CASING LENGTH : 5.5
SCREEN LENGTH : 5.0
SLOT SIZE : 0.01
TYPE : 304 Stainless Steel
TYPE : 304 Stainless Stee

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION
							Gravel (GW) - crushed limestone, gray
							FILL - gravel, brick fragments, little silt
			S-2	s.s	13	0	
							SAND (SP) - fine to medium grained, gray
			S-3	s.s.	11	0	
5							
							CLAY (OH) - organic, highly plastic, gray
10							END OF BORING @ 10.0 FEET

GRAPHIC LOG | WELL COMPLETION | WATER (3-27-90) | DEPTH (feet)

ATTACHMENT 2

TABLES

TABLE 1

SUMMARY OF SOIL SAMPLING RESULTS[1]

	Sample Number					
Parameter	MW1A 3'- 5'	MW2A 1'- 3'	MW2A 3'- 5'	MW3A 3'- 5'	MW3B 3'- 5'	Equip.[2] Blank
Benzene	<125[3]	<125	<125	<125	<125	NA[4]
Ethylbenzene	<125	<125	<125	<125	270	NA
Toluene	<125	<125	<125	<125	<125	NA
Xylene	<125	<125	<125	<125	<125	NA
Formaldehyde	<0.100	0.190	0.148	<0.100	0.132	<0.025
Styrene	<125	<125	<125	<125	<125	NA

---

1 BTEX and Styrene concentrations reported in parts per billion (ppb) = μg/kg. Formaldehyde concentrations reported in parts per million (ppm) = mg/kg.

2 Equipment Blank

3 < indicates concentration is below the method detection limit. The number following the < is the detection limit.

4 NA = Not Analyzed

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS[1]

Parameter	MW-1A	MW-2A	MW-3A	MW-3B[2]	E.B.[3]	T.B.[4]
Benzene	<1[5]	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1	<1
Xylene	<1	<1	<1	<1	<1	<1
Formaldehyde	0.42	<0.025	0.068	0.068	0.076	NA[6]
Styrene	<1	<1	<1	<1	<1	<1

---

1 BTEX and Styrene concentrations reported in parts per billion (ppb) = µg/L. Formaldehyde concentrations reported in parts per million (ppm) = mg/k.

2 Duplicate of sample MW-3A

3 Equipment Blank

4 Trip Blank Sample

5 < indicates concentration is below the method detection limit. The number following the < is the detection limit.

6 NA = Not Analyzed

TABLE 3

RELATIVE SURFACE AND GROUNDWATER ELEVATIONS[1]

Monitoring Well Number	Relative Ground Surface Elevation (ft.)	Relative Top of Casing Elevation (ft.)	Depth to Groundwater (ft.)[2]	Relative Groundwater Elevation (ft.)
MW-1	97.10	99.33	7.32	92.01
MW-2	95.37	97.93	3.98	93.95
MW-3	95.50	97.68	4.50	93.18
MW-4	96.32	98.68	4.93	93.75
MW-5	96.18	98.88	5.10	93.78
MW-6	99.37	101.65	8.79	92.86
MW-7	99.41	101.89	6.28	95.61
MW-1A	96.29	98.42	4.71	93.71
MW-2A	96.22	98.78	5.28	93.50
MW-3A	95.24	97.98	4.72	93.26
MW-4A	96.26	98.68	3.58	95.10

[1] The bolt on the top of the hydrant to the east of the maintenance shop was assumed to have an elevation of 100.00 feet. The above elevations are computed relative to the assumed bolt elevation.

[2] Groundwater depths obtained on May 3, 1990.

ATTACHMENT 3

LABORATORY REPORT (SOIL SAMPLES)

ENSR

Formerly ERT

DATE: 04/25/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-260 LAB NO.: A4003

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

Attached are reports of chemical analyses of samples received March 27, 1990. These analyses are:

Count	Test Code	Test Name	Test Method	Sampled	Matrix
6	BENZ -S- -HOU	BENZENE ON SOLID	EPA SW-846: 8020, GC	03/26/90	SOLID* CLAY*
6	EB -S- -HOU	ETHYL BENZENE ON SOLID	EPA SW-846: 8020, GC	03/26/90	SOLID* CLAY*
1	FORM - - -KEM	FORMALDEHYDE	NIOSH #3500	03/26/90	WATER
5	FORM -S- -KEM	FORMALDEHYDE	NIOSH #3500	03/26/90	SOLID* CLAY*
6	STYRN-S- -HOU	STYRENE ON SOLID	EPA SW-846: 8020, GC	03/26/90	SOLID* CLAY*
6	TOL -S- -HOU	TOLUENE ON SOLID	EPA SW-846: 8020, GC	03/26/90	SOLID* CLAY*
6	XYL -S- -HOU	XYLENE ON SOLID	EPA SW-846: 8020, GC	03/26/90	SOLID* CLAY*

Data contained in this report reflect a full quality control review and have met all applicable standards established by ENSR. ENSR quality assurance protocols are in accordance with EPA guidelines.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

BB/lis

Enclosures: Analytical Summary, Analytical Report, Chain of Custody, Sample Receipt Checklist, Quality Control Logs, Billing Summary

LAB NO. A4003
PROJECT 9500-058-260 FINA

ENSR

Formerly ERT

SAMPLE DISPOSAL LETTER

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

DATE: 04/25/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-260 FINA LAB NO.: A4003 RECEIVED:03/27/90

It is the policy of ENSR Laboratories to dispose of unanalyzed portions of samples thirty days following submittal of the hard copy data package. Samples from lab number A4003 are due for disposal on May 16, 1990.

Please indicate your preference for disposal below and return this form to Lab Receiving personnel by May 2, 1990. No response will be interpreted as permission to return the samples on May 16, 1990.

( )A. ENSR's preferred policy for disposal is to return all remaining samples, including samples not authorized for analysis to the originating site at our expense. This option will be exercised unless this letter is returned with instructions indicating otherwise.

( )B. ENSR will dispose of unused samples, including samples not analyzed, by drumming and transporting by a federally licensed hazardous waste transportation firm at a cost of $5.00/sample. Samples known to be excessively contaminated may be disposed of at a cost of $10.00/sample.

( )C. ENSR will hold your sample at a cost of $15.00/sample per quarter for refrigerated storage or $5.00/sample per quarter for ambient storage. The project will be billed in advance each quarter based upon the number of samples in storage at the beginning of the quarter. The minimum storage fee per project will be $50.00 to cover administrative costs.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

SIGNATURE: _____

TITLE: _____ DATE: ___/___/___

LAB USE ONLY: DISPOSAL METHOD, DATE, AUTHORIZATION: _____

BB/lis

LAB NO. A4003
PROJECT 9500-058-260 FINA

ENSR Labs-Houston

Analytical Summary
04/25/90 08:04

Lab Number: A4003
Project: 9500-058-260
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	1 MW1A/3'-5' SOLID*	2 MW2A/1'-3' CLAY*	3 MW2A/3'-5' SOLID*	4 MW3A/3'-5' SOLID*	5 MW3B/3'-5' SOLID*	6 EQUIP. BLANK SOLID*	7 EQUIP. BLANK WATER
BENZ -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	--
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	
EB -S- -HOU	<125 UG/KG	<125 UG/KG	260 UG/KG	<125 UG/KG	270 UG/KG	<125 UG/KG	--
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	
FORM - - -KEM	--	--	--	--	--	--	<0.025 MG/L
(MDL)							*(0.025)**
FORM -S- -KEM	<0.100 MG/KG	0.190 MG/KG	0.148 MG/KG	<0.100 MG/KG	0.132 MG/KG	--	--
(MDL)	*(0.100)**	*(0.100)**	*(0.100)**	*(0.100)**	*(0.100)**		
STYRN-S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	--
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	
TOL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	--
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	
XYL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	--
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	

QAQC Approval: Dee Davis Date: 4-25-90

Mgr. Approval: Brenda P. Basile Date: 4/25/90

* Please see attached Analytical Report for remarks.

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:24

FINA	Field ID: MW1A/3'-5'	Date Sampled: 03/26/90
Proj. No.: 9500-058-260	Lab ID: 1	Time Sampled: 900
Lab No.: A4003	Matrix: SOLID* (COMPOSITE)	Date Received:03/27/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
FORM -S- -KEM FORMALDEHYDE NIOSH #3500	<0.100 *1	MG/KG	0.100	04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90

*1 *MATRIX CONT.:SANDY

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 10:24

FINA	Field ID: MW2A/1'-3'	Date Sampled: 03/26/90
Proj. No.: 9500-058-260	Lab ID: 2	Time Sampled: 1100
Lab No.: A4003	Matrix: CLAY* (COMPOSITE)	Date Received:03/27/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
FORM -S- -KEM FORMALDEHYDE NIOSH #3500	0.190 *1	MG/KG	0.100	04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/28/90

*1 *MATRIX CONT.:SANDY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: MW2A/3'-5'	Date Sampled: 03/26/90
Proj. No.: 9500-058-260	*Lab ID:* 3	*Time Sampled:* 1100
Lab No.: A4003	Matrix: SOLID* (COMPOSITE)	Date Received:03/27/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	260 *1	UG/KG	125	03/29/90
FORM -S- -KEM FORMALDEHYDE NIOSH #3500	0.148 *1	MG/KG	0.100	04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90

*1 *MATRIX CONT.:SANDY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: MW3A/3'-5'	Date Sampled: 03/26/90
Proj. No.: 9500-058-260	Lab ID: 4	Time Sampled: 1330
Lab No.: A4003	Matrix: SOLID*	Date Received:03/27/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
FORM -S- -KEM FORMALDEHYDE NIOSH #3500	<0.100 *1	MG/KG	0.100	04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90

*1 *MATRIX CONT.: SANDY

ENSR Labs-Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: MW3B/3'-5'	Date Sampled: 03/26/90
Proj. No.: 9500-058-260	Lab ID: 5	Time Sampled: 1330
Lab No.: A4003	Matrix: SOLID*	Date Received:03/27/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/09/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	270 *1	UG/KG	125	04/09/90
FORM -S- -KEM FORMALDEHYDE NIOSH #3500	0.132 *1	MG/KG	0.100	04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/09/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/09/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/09/90

*1 *MATRIX CONT.:SANDY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: EQUIP. BLANK	Date Sampled: 03/26/90
Proj. No.: 9500-058-260	Lab ID: 6	Time Sampled: 1400
Lab No.: A4003	Matrix: SOLID*	Date Received:03/27/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	03/29/90

*1 *MATRIX CONT.:SANDY

ENSR Labs—Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: EQUIP. BLANK	Date Sampled: 03/26/90
Proj. No.: 9500-058-260	Lab ID: 7	Time Sampled: 1400
Lab No.: A4003	Matrix: WATER	Date Received: 03/27/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
FORM - - -KEM FORMALDEHYDE NIOSH #3500	<0.025 *1	MG/L	0.025	04/05/90

*1 HOLDING TIME EXPIRED BEFORE ANALYSIS

ENSR

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING
2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.	Client/Project Name	Project Location
9500-058-260	FINA	CALUMET CITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
	MW1A 3 to 5	3-26-90 0900		X	SOIL 4 OZ	SANDY	4°C	BTEX, STYRENE	
	MW1A 3 to 5	3-26-90 0900		X	SOIL 4 OZ AMB	SANDY	4°C	FORMALDEHYDE	
	MW2A 1 to 3	3-26-90 1100		X	SOIL 4 OZ AMB	SANDY	4°C	FORMALDEHYDE	
	MW2A 3 to 5	3-26-90 1100		X	SOIL 4 OZ AMB	SANDY	4°C	FORMALDEHYDE	
	MW2A 1 to 3	3-26-90 1100		X	SOIL 4 OZ	SANDY-CLAY	4°C	BTEX, STYRENE	
	MW2A 3 to 5	3-26-90 1100		X	SOIL 4 OZ	SANDY	4°C	BTEX, STYRENE	
	MW3A 3 to 5	3-26-90 1330			SOIL 4 OZ AMB	SANDY	4°C	FORMALDEHYDE	
	MW3A 3 to 5	3-26-90 1330			SOIL 4 OZ	SANDY	4°C	BTEX, STYRENE	
	MW3B 3 to 5	3-26-90 1200			SOIL 4 OZ	SANDY	4°C	FORMALDEHYDE	
	MW3B 3 to 5	3-26-90 1400			SOIL 4 OZ	SANDY	4°C	BTEX, STYRENE	

Samplers: (Signature)	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: 3-26-90 Time: 1530	COC Seal No.
Tony Dapprich			Tony Dapprich		34256
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	
	Relinquished by: (Signature)	Date: Time:	Received by Laboratory: (Signature)	Date: 3-27-90 Time: 0910	Contact:

REMARKS:

Date Results To:
1:
2

Laboratory No.
A4003

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING
2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.	Client/Project Name	Project Location
9500-058-260	FINA	CALUMET CITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
[redacted]		3-26-90 200		(2)	SOIL 40ml/E	SANDY	4°C	EQUIPMENT BLANK	
[redacted] TP		3-26-90 1400			1+2G (VIALS) 802 AMB	WATER	4°C	EQUIPMENT BLANK	
[redacted]									
[redacted]									

Samplers: (Signature)	Relinquished by: (Signature)	Date: Time:	Received by: (Signature) Tony Dapper	Date: 3-26-90 Time: 1530	COC Seal No. 34256
Tony Dapper					
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	
	Relinquished by: (Signature)	Date: Time:	Received by Laboratory: (Signature) Allen Holub	Date: 3-27-90 Time: 0910	Intact:

REMARKS:

Data Results To:
1.
2.

Laboratory No. A4003

ENSR LABORATORIES ®
SAMPLE RECEIPT CHECKLIST

CLIENT Tuna PROJECT NO. 9500-058-210 LAB NO. A14003

1. ✓ shipped — NOTES: Fedex - 250391862 20
   ____ hand-delivered
2. ✓ COC present on receipt — NOTES:
   ____ no COC
3. ✓ COC tape on shipping container — NOTES: # 31256
   ____ no COC tape
4. ____ samples broken/leaking on receipt — NOTES: Intact
   ✓ samples intact on receipt
   ____ other, see notes
5. ____ ambient on receipt — NOTES:
   ✓ chilled on receipt
6. ✓ samples preserved correctly — NOTES:
   ____ improper preservatives
   ____ N/A, no recommended preservatives
   ____ other, see notes
7. ✓ received within holding times — NOTES:
   ____ not received within holding times
   ____ N/A, no recommended holding time
   ____ other, see notes
8. ____ COC tapes on samples — NOTES:
   ✓ no COC tapes
9. ____ discrepancies between COC and sample labels — NOTES: Lab ID 2 has the same field ID but different matrix
   ____ no discrepancies noted
   ____ N/A, no COC received
   ✓ other, see notes

Additional comments:

Samples inspected and logged in by: Julie Hlubb Date/Time: 3-27-90 0910

E R CONSULTING AND ENGINEERING-HOUSTON LABORATORY
Q..LITY CONTROL LOG
SW 846: 8020; BTEX ANALYSIS

L :ORATORY NO: A4003

LAB ID	SPIKED AMT(UG)	CALC AMT(UG)	PERCENT RECOVERY (75-125%)
CC032890	30	29.08	97
[ )32890	30	29.87	100
1	30	36.23	121
[	30	30.93	103
	30	36.58	122
4	30	35.26	118
	30	36.47	122
6	30	40.26	134
:040990	30	28.04	93
"3040990	30	25.92	86

BLANK ANALYSIS DATE: 3/28/90

NO BTEX DETECTED AT STATED METHOD DETECTION LIMITS

COMMENTS:

Al Bennan 4/10/90
ANALYST SIGNATURE DATE

Brenda P. Basile 4/10/90
QAQC COORDINATOR DATE

Summary of QA/QC Results

Date received: 28-MAR-1990 Customer: ENSR Laboratories Job name: M90-03.155

		Samples						
Keystone ID		155-001	155-002	155-004	155-005	155-006	155-015	155-016
Sampling Point		QA_QC	QA_QC	QA_QC	QA_QC	QA_QC	QA_QC	QA_QC
Customer ID		LAB BLANK	LAB CONTROL SAMPLE	A4003-1 DUP	A4003-1 MS	A4003-1 MSD	A4004-3 MS	A4004-3 MSD
Parameters	Units							
%Solids at 103°C	%	NR	NR	72.8	NR	NR	NR	NR
Formaldehyde	mg/L	<0.025	109 % Rec.	NR	78.8 % Rec.	95.9 % Rec.	92.8 % Rec.	92.8 % Rec.

ATTACHMENT 4

LABORATORY REPORT (GROUNDWATER SAMPLES)

ENSR

Formerly ERT

DATE: 04/18/90

TO: Tony Dappas

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-330 LAB NO.: A4036

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

Attached are reports of chemical analyses of samples received April 2, 1990. These analyses are:

Count	Test Code	Test Name	Test Method	Sampled	Matrix
6	BENZ - - -HOU	BENZENE	EPA SW-846: 8020, GC	03/30/90	WATER
6	EB - - -HOU	ETHYL BENZENE	EPA SW-846: 8020, GC	03/30/90	WATER
5	FORM - - -KEM	FORMALDEHYDE	NIOSH #3500	03/30/90	WATER
6	STYRN- - -HOU	STYRENE	EPA SW-846: 8020, GC	03/30/90	WATER
6	TOL - - -HOU	TOLUENE	EPA SW-846: 8020, GC	03/30/90	WATER
6	XYL - - -HOU	XYLENE	EPA SW-846: 8020, GC	03/30/90	WATER

Data contained in this report reflect a full quality control review and have met all applicable standards established by ENSR. ENSR quality assurance protocols are in accordance with EPA guidelines.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

BB/lis

Enclosures: Analytical Summary, Analytical Report, Chain of Custody, Sample Receipt Checklist, Quality Control Logs, Billing Summary

LAB NO. A4036
PROJECT 9500-058-330 Roham/Haas

ENSR Labs—Houston

Analytical Summary
04/18/90 16:52

Lab Number: A4036
Project: 9500-058-330
Roham/Haas

Lab ID *Field ID* *Test /Matrix*	1 MW-1A WATER	2 MW-2A WATER	3 MW-3A WATER	4 MW-3B WATER	5 E.B. WATER	6 T.B. WATER
BENZ - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
EB - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
FORM - - -KEM	0.042 MG/L	<0.025 MG/L	0.068 MG/L	0.068 MG/L	0.076 MG/L	--
(MDL)	*(0.025)*	*(0.025)*	*(0.025)*	*(0.025)*	*(0.025)*	
STYRN- - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
TOL - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
XYL - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*

QAQC Approval: Dee Davis Date: 4-23-90

Mgr. Approval: Brenda P. Basile Date: 4/23/90

ENSR

ENSR Labs—Houston

Analytical Report
04/20/90 14:46

Roham/Haas	Field ID: MW-1A	Date Sampled: 03/30/90
Proj. No.: 9500-058-330	Lab ID: 1	Time Sampled: 1235
Lab No.: A4036	Matrix: WATER	Date Received: 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.042	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90

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ENSR Labs-Houston

Analytical Report
04/20/90 14:46

Roham/Haas	Field ID: MW-2A	Date Sampled: 03/30/90
Proj. No.: 9500-058-330	Lab ID: 2	Time Sampled: 1255
Lab No.: A4036	Matrix: WATER	Date Received:04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	<0.025	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90

ENSR Labs-Houston

Analytical Report
04/20/90 14:46

Roham/Haas	Field ID: MW-3A	Date Sampled: 03/30/90
Proj. No.: 9500-058-330	Lab ID: 3	Time Sampled: 1340
Lab No.: A4036	Matrix: WATER	Date Received:04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.068	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90

ENSR Labs-Houston

Analytical Report
04/20/90 14:46

Roham/Haas	Field ID: MW-3B	Date Sampled: 03/30/90
Proj. No.: 9500-058-330	Lab ID: 4	Time Sampled: 1320
Lab No.: A4036	Matrix: WATER	Date Received:04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.068	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90

ENSR Labs—Houston

Analytical Report
04/20/90 14:46

Roham/Haas	Field ID: E.B.	Date Sampled: 03/30/90
Proj. No.: 9500-058-330	Lab ID: 5	Time Sampled: 1320
Lab No.: A4036	Matrix: WATER	Date Received:04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.076	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90

ENSR Labs-Houston

Analytical Report
04/20/90 14:46

Roham/Haas	Field ID: T.B.	Date Sampled: 03/30/90
Proj. No.: 9500-058-330	Lab ID: 6	Time Sampled:
Lab No.: A4036	Matrix: WATER	Date Received:04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90

ENSR

Formerly ERT

SAMPLE DISPOSAL LETTER

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

DATE: 04/18/90

TO: Tony Dappas

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-330 LAB NO.: A4036 RECEIVED:04/02/90
Roham/Haas

It is the policy of ENSR Laboratories to dispose of unanalyzed portions of samples thirty days following submittal of the hard copy data package. Samples from lab number A4036 are due for disposal on May 23, 1990.

Please indicate your preference for disposal below and return this form to Lab Receiving personnel by May 9, 1990. No response will be interpreted as permission to return the samples on May 23, 1990.

( )A. ENSR's preferred policy for disposal is to return all remaining samples, including samples not authorized for analysis to the originating site at our expense. This option will be exercised unless this letter is returned with instructions indicating otherwise.

( )B. ENSR will dispose of unused samples, including samples not analyzed, by drumming and transporting by a federally licensed hazardous waste transportation firm at a cost of $5.00/sample. Samples known to be excessively contaminated may be disposed of at a cost of $10.00/sample.

( )C. ENSR will hold your sample at a cost of $15.00/sample per quarter for refrigerated storage or $5.00/sample per quarter for ambient storage. The project will be billed in advance each quarter based upon the number of samples in storage at the beginning of the quarter. The minimum storage fee per project will be $50.00 to cover administrative costs.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

SIGNATURE: _____

TITLE: _____ DATE: ___/___/___

LAB USE ONLY: DISPOSAL METHOD, DATE, AUTHORIZATION: _____

BB/lis

LAB NO. A4036
PROJECT 9500-058-330 Roham/Haas

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING

2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.: 9500-058-330

Client/Project Name: Rohm / HAAS

Project Location: CAL. CITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
1	MW-1A	3-30-90 1235		(2)	40ml VOA	H_2O	4°C	BTEX, STYRENE	
1	MW-1A	3-30-90 1235		(1)	250ml AMB	H_2O	4°C	FORMALDEHYDE	
2	MW-2A	3-30-90 1255		(2)	40ml VOA	H_2O	4°C	BTEX, STYRENE	
2	MW-2A	3-30-90 1255		(1)	250ml AMB	H_2O	4°C	FORMALDEHYDE	
3	MW-3A	3-30-90 1340		(2)	40ml VOA	H_2O	4°C	BTEX, STYRENE	
3	MW-3A	3-30-90 1340		(1)	250ml AMB	H_2O	4°C	FORMALDEHYDE	
4	MW-3B	3-30-90 1350		(2)	40ml VOA	H_2O	4°C	BTEX, STYRENE	
4	MW-3B	3-30-90 1350		(1)	250ml AMB	H_2O	4°C	FORMALDEHYDE	
5	E.B	3-30-90 1320		(2)	40ml VOA	H_2O	4°C	EQUIP. BLANK	
5	E.B.	3-30-90 1320		(1)	250ml AMB	H_2O	4°C	EQUIP BLANK	

Samplers: (Signature) Tony Dapper

Affiliation

Relinquished by: (Signature) Tony Dapper — Date: 3-30-90 Time: 0800

Received by: (Signature) Tony Dapper — Date: 3-30- Time: 1700

Relinquished by: (Signature) — Date: Time:

Received by: (Signature) — Date: Time:

Relinquished by: (Signature) — Date: Time:

Received by Laboratory: (Signature) Julie Holub — Date: 3-31- Time: 0855

COC Seal No. 34282 34283 Intact

REMARKS:

2 TRIP BLANKS INCLUDED, 40ml UNDER JOB # 9500-058-330

Data Results To:

1.

2.

Laboratory No. A4035

A4036

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING
2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.	Client/Project Name	Project Location
9500-058-330	Rohm/Haas	

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp.	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
6	T.B.	3-30-92		(2)	40 ml VOAs	H_2O	4°C	Trip Blank	

Samplers: *(Signature)*	Relinquished by: *(Signature)*	Date: Time:	Received by: *(Signature)*	Date: Time:	COC Seal No.
	Relinquished by: *(Signature)*	Date: Time:	Received by: *(Signature)*	Date: Time:	
Affiliation	Relinquished by: *(Signature)*	Date: Time:	Received by Laboratory: *(Signature)* [signature]	Date: 4-2-92 Time: 0855	Intact:
REMARKS:			Date Results To: 1. 2.		Laboratory No. A4036

ENSR LABORATORIES ®
SAMPLE RECEIPT CHECKLIST

CLIENT Rohm/Haas PROJECT NO. 9500-058-330 LAB NO. A4036

1. ✓ shipped — NOTES: Fedex -2503918064
   ____ hand-delivered
2. ✓ COC present on receipt — NOTES:
   ____ no COC
3. ✓ COC tape on shipping container — NOTES: # 34282 & 34283
   ____ no COC tape
4. ____ samples broken/leaking on receipt — NOTES: intact
   ✓ samples intact on receipt
   ____ other, see notes
5. ____ ambient on receipt — NOTES:
   ✓ chilled on receipt
6. ✓ samples preserved correctly — NOTES:
   ____ improper preservatives
   ____ N/A, no recommended preservatives
   ____ other, see notes
7. ✓ received within holding times — NOTES:
   ____ not received within holding times
   ____ N/A, no recommended holding time
   ____ other, see notes
8. ____ COC tapes on samples — NOTES:
   ✓ no COC tapes
9. ____ discrepancies between COC and sample labels — NOTES:
   ____ no discrepancies noted
   ____ N/A, no COC received
   ✓ other, see notes

Additional comments:
Added a Trip Blank to project # 9500-058-330 per. T. Dapple

Samples inspected and logged in by: Julie Holub Date/Time: 4-2-90 0855

NSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
UALITY CONTROL LOG-MATRIX SPIKE
SW 846: 8020; BTEX ANALYSES

ABORATORY NO: A4036

IATRIX SPIKE RECOVERIES SAMPLE: 5

ANALYTE	SPIKE (UG/L)	SAMPLE (UG/L)	CONC MS	% REC	CONC MSD	% REC	RPD	QC LIMITS % REC	* RPD
ENZENE	20	0	20	100	17	86	16	39-150	15
TOLUENE	20	0	19	95	16	80	17	46-148	15
ETHYLBENZENE	20	0	19	95	16	78	20	32-160	15
TOTAL XYLENES	20	0	18	90	15	74	19	35-150	15

COMMENTS:
* RPD limits have not been set from control charts; these are tentative limits

C L Beeman 4-16-90
ANALYST SIGNATURE DATE

Brenda P. Basile 4/16/90
QAQC COORDINATOR DATE

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG
SW 846: 8020; BTEX ANALYSIS

LABORATORY NO: A4036

LAB ID	SPIKED AMT(UG)	CALC AMT(UG)	PERCENT RECOVERY (75-125%)
CC041090	30	27.24	91
MB041090	30	33.62	112
5	30	27.31	91
5MS	30	29.20	97
5MSD	30	27.98	93
1	30	30.41	101
2	30	29.72	99
3	30	29.88	100
4	30	30.59	102
6	30	29.55	98

BLANK ANALYSIS DATE: 4/10/90

NO BTEX DETECTED AT STATED METHOD DETECTION LIMITS

COMMENTS:

4-17-90
ANALYST SIGNATURE

Brenda P. Leslie 4/16/90
QAQC COORDINATOR

Summary of QA/QC Results

Date received: 4-MAR-1990 Customer: ENSR Laboratories Job name: M90-04.16

Parameters	Units	Samples			
Keystone ID		16-001	16-002	16-009	16-010
Sampling Point		QA_QC	QA_QC	QA_QC	QA_QC
Customer ID		LAB BLANK	LAB CONTROL SAMPLE	A4035-6 MS	A4035-6 MSD
Formaldehyde	mg/L	<0.025	109 % Rec.	80.5 % Rec.	79.3 % Rec.